

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO.

WASTE DISCHARGE REQUIREMENTS

FOR

KIRKWOOD PUBLIC UTILITY DISTRICT
WASTEWATER TREATMENT PLANT
AMADOR COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Water Board) finds that:

1. Kirkwood Public Utility District (KPUD), hereafter referred to as Discharger, submitted a Report of Waste Discharge (RWD) in March 2006 to update existing Waste Discharge Requirements (WDRs) for the KPUD wastewater treatment plant. The WDRs are being updated because the Discharger proposes to upgrade the existing wastewater treatment system and install a new disposal system. Supplemental information was received on September 2006, 14 December 2006, and 8 June 2007. 7
2. For the purposes of this Order, the term "Wastewater Treatment Plant" (WWTP) shall mean the wastewater collection system, the wastewater treatment system, the sludge treatment and drying facilities, and the wastewater disposal system. The Discharger's RWD refers to the disposal system as absorption beds, or better know as leachfields. In the remainder of this order the absorption beds are referred to as leachfields.
3. The Discharger owns and operates the WWTP, which is located at 33540 Loop Road, Kirkwood, Amador County. The treatment plant and disposal sites are located in Assessors Parcel No. 06-010-001 in Sections 27 and 28, T10N, R17E MDB&M, as shown on Attachment A and is attached hereto and made part of this Order by reference.
4. WDRs Order No. 94-108, adopted by the Regional Water Board on 22 April 1994, prescribes requirements for the KPUD WWTP. This Order is neither adequate nor consistent with the current plans and policies of the Regional Board.
5. The WWTP treats and disposes of wastewater generated from residential and commercial units located in the community of Kirkwood, and the Kirkwood ski.

Wastewater Treatment and Disposal System

6. In the fall of 2005, the Discharger upgraded its WWTP from a conventional activated sludge treatment process to a membrane bioreactor (MBR) treatment process. The upgraded wastewater treatment provides tertiary treatment and disinfection. The treatment process includes influent screening, equalization storage, anoxic basins for denitrification, chemical additives for phosphorus removal, aeration basins, membrane basins, membrane filtration, disinfection with sodium hypochlorite, an effluent pump system, aerobic sludge

storage, centrifuge sludge dewatering system, and an emergency storage tank. Because of climatic conditions (i.e., significant winter snowfall) a majority of the wastewater treatment system is located inside of a building. A treatment system flowchart is presented in Attachment B, which is attached hereto and made part of this Order by reference. Each treatment component is further described below. The upgraded wastewater treatment system has a monthly average design capacity of 190,000 gallons per day (gpd) and a peak daily flow of 274,000 gpd. According to information provided in the Discharger's monthly self-monitoring reports for the year 2006, the monthly average influent flows range from approximately 21,300 to 92,650 gpd, with highest flows occurring during the late winter and early spring when snowmelt tends to occur.

7. Wastewater is delivered to the treatment system via an influent pump station. The influent pump station has two submersible pumps that can each pump up to 230 gallons per minute. To handle increased influent flows in the future, the pump station will be upgraded by adding two new pumps that can pump up to 400 gpm, each. Influent wastewater is screened using an automatic fine screen with 1/8-inch perforations that incorporates screening, washing, and compaction functions. The purpose of the screening is to remove larger solids and grit that could damage pumps or interfere with downstream process equipment. Screenings and grit are accumulated in a bagging unit and are picked up weekly for off-site disposal.
8. As part of the WWTP in upgrade in 2005, the Discharger installed a magnetic influent flow meter. However, the Discharger reported that the influent flow meter is not functioning correctly. The Discharger has been monitoring flows at the WWTP by monitoring effluent being discharged to the effluent disposal system. This Order requires the Discharger to monitor influent flows to the treatment plant and also requires the Discharger to fix or replace the influent flow meter so influent flows can be measured.
9. After screening, influent is routed into one of two equalization basins and/or an emergency storage basin (when needed) prior to being pumped into the treatment process. The main function of the equalization storage basins is to allow a portion of peak flows to be stored and then treated after flows subside. This allows the treatment process to be more reliable under peak flows. If Equalization Basin No. 1 becomes filled and there is need to store additional screened wastewater, then excess flow (influent flow minus flow to the MBR) is pumped from Equalization Basin No. 1 to Equalization Basin No. 2. If Equalization Basin No. 2 is filled and excess flows continue, Equalization Basin No. 2 overflows into Emergency Storage Basin No. 1. Equalization Basins Nos. 1 and 2, and the Emergency Storage Basin are closed (i.e., covered) hydraulic structures and are designed to provide one foot of freeboard. The equalization basins and storage basin sizes are as follows:

<u>Basin</u>	<u>Storage Volume (gallons)</u>
Equalization Basin No. 1	60,000
Equalization Basin No. 2	140,000
Emergency Storage Basin No. 1	65,000

10. Prior to wastewater being pumped from Equalization Basin No. 1 into the MBR treatment process, wastewater flows into four Anoxic Basins where it is denitrified. Each Anoxic Basin is concrete lined and has a storage capacity of approximately 12,850 gallons. Aluminum and caustics are then added to the wastewater to remove phosphorus.
11. After wastewater is denitrified and phosphorus removed, it is conveyed into the MBR treatment process, which includes two aeration basins, recirculation pumps, two membrane basins, and membrane filtration facilities.
12. Disinfection is performed by the addition of sodium hypochlorite to the MBR effluent. Duplex sodium hypochlorite feed units are used for redundancy. A 38,400-gallon chlorine contact basin is used to maximize contact time.
13. Besides emergency storage provisions, the WWTP incorporates many features that provide a high degree of reliability. All key mechanical equipment systems are provided with redundant standby units so that treatment can precede a full capacity even when a piece of equipment fails. All pumping and aeration blowers have redundant units. The treatment system also includes multiple process basins so that treatment can continue if a basin is taken out of service for any reason. The KPUD generates its own electrical power with onsite diesel generators. There are three normal power generators and one backup emergency generator. Only two of the four generators are needed to serve all key demands of the treatment facility at design capacity.
14. Disinfected wastewater is pumped via an effluent pump station to the effluent disposal system. The current effluent disposal system consists of approximately 3,040 linear feet of pressure-dosed leachline, which is divided among eight leachfields (leachfields 1 through 6, 10, and 10a) as shown on Attachment C and is attached hereto and made part of this Order by reference. The Discharger plans to abandon leachfields 5 and 6, and replace those with leachfields 7, 8 and 9 (installed in 2006), resulting in approximately 3,000 linear feet of disposal piping. The depth of the disposal trenches ranges from approximately four to six feet below ground surface. The Discharger's RWD indicates that effluent disposal system is designed to dispose of a monthly average flow of 190,000 gpd and a peak daily flow of 429,000 gallons.
15. In 1983, permeability testing of the soil in the area of current disposal system was conducted. Results of the testing indicate that the percolation rates ranged from approximately 2.2 to 11.4 inches per minute.
16. In March 2004, a hydrogeologic investigation of the effluent disposal system area was performed to determine whether the disposal system has enough hydraulic disposal capacity to accept a monthly average flow of 190,000 gpd. Results of the investigation indicate that the disposal system has sufficient disposal capacity, and that groundwater levels would rise to a maximum of two feet below the bottom of the disposal trenches.
17. Monitoring of wastewater depth in absorption bed disposal trenches can aid in estimating the condition of the effluent disposal system and in adjusting distribution of wastewater

within the disposal system. Each individual absorption bed lateral has a monitoring port that terminates at the bottom of the gravel bed within the disposal trenches. The monitoring ports are equipped with a transducer that measures the water pressure in the disposal trenches, and the data is transmitted back to a receiving unit at the WWTP. Water level measurement data is reviewed by WWTP staff on a daily basis to ensure that the wastewater disposal system is working correctly and overflows (due to hydraulic overloading) do not occur.

18. Waste sludge from the MBR treatment process is accumulated and partially digested in an aerated solids holding tank. Sludge from the holding tank is dewatered using a centrifuge. The dewatered sludge is disposed of at an off-site landfill by a commercial hauling service.

Effluent Characteristics

19. Potable water for the community of Kirkwood and the Kirkwood Ski Resort is supplied by four groundwater supply wells. KPUD provided potable water quality data for the year 2005, which is presented in the table below:

<u>Constituent</u>	<u>Units</u>	<u>2005 Results</u>			
		<u>Well #2</u>	<u>Well #3</u>	<u>Well #4</u>	<u>Well #5</u>
Iron	mg/L	61	<50	<50	<50
Chloride	mg/L	2.7	2.0	1.1	1.6
Sodium	mg/L	4.8	33.4	16	16
Nitrate (as NO ₃)	mg/L	0.54	<0.05	<0.05	<0.05
Nitrate (as N)	mg/L	<0.05	<0.05	<0.05	<0.05
TDS ¹	mg/L	89	178	157	157
Manganese	ug/L	<20	<30	50	50
Zinc	ug/L	.043	<0.05	<0.02	<0.02
EC ²	umho/cm	91	250	201	197
Total Trihalomethanes	ug/L	ND	ND	ND	ND
Total Coliform Organisms	MPN	ND	ND	ND	ND

¹Total Dissolved Solids

²Electrical Conductivity

20. As documented in the monthly monitoring reports, effluent wastewater quality for time period of January 2006 through January 2007 is characterized below. This data reflects the effluent from the upgraded MBR treatment process:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average Effluent Concentration</u>
BOD ₅	mg/L	<1.0 to 3.6
Suspended Solids	mg/L	<1.0 to 2.0
Total Nitrogen (as N)	mg/L	10.5 to 19.8
Total Phosphorus	mg/L	0.2 to 10.4 ¹
Total Dissolved Solids	mg/L	217 to 1620 ¹
Total Coliform Organisms	MPN/100ml	< 2.0 to <425 ¹
pH	Standard Units	6.8 to 8.3

¹ Elevated concentrations of total phosphorus, total dissolved solids, and total coliform organisms were due to a plant upset from maintenance on the MBR membranes in the month of November 2006. Excluding the high concentrations of total phosphorous, total dissolved solids, and total coliform in November 2006, the highest monthly average concentrations for total phosphorous, total dissolved solids, and total coliform were 3.8 mg/L, 458 mg/L, and <2.0 MPN/100ml, respectively.

21. The RWD provided the projected effluent concentrations for the WWTP, which are presented in the table below:

Approximate Seasonal Averages Based on Temperature and Snowmelt

<u>Constituent</u>	<u>Warm Season (May through October)</u>	<u>Cold Season (November through April)</u>
TKN	<2	<2
Ammonia (as N) mg/L	<1	<1
Nitrate (as N) mg/L	2 to 15	10 to 25
Total Nitrogen, mg/L	15	25
TDS, mg/L	200 to 800 ^a	200 to 700 ^a
pH	6.3 to 7.0	6.4 to 7.0

^a When residential occupancy is very low (i.e., late spring), the salinity tends to be very low. When infiltration and inflow is very low (i.e., during the early fall), the salinity can be very high because of water conservation measures taken by the permanent residents due to the cost of water.

With the exception of TDS and pH, the projected effluent quality that the upgraded WWTP will provide is similar to that of what the WWTP effluent quality was during 2006. TDS effluent quality was generally lower than the projected 700 to 800 mg/l (maximum concentrations), while pH units were a little higher in effluent quality during 2006 compared to the projected pH effluent quality.

Wastewater Collection System

22. The Discharger owns and maintains approximately 8.3 miles of six-inch gravity sewer lines, and approximately 3,600 feet of eight-inch force main sewer lines. Within the KPUD collection system there are two sewage pump stations. Both pump stations have alternate power capabilities in case of power outages. KPUD owns a portable generator that can provide alternate power if the emergency power system fails for any reason. Each pump station has alarms for high water levels and are connected to the WWTP SCADA system. When the WWTP is not manned, the alarm automatically notifies WWTP staff of potential problems at the pump stations.

23. KPUD plans to conduct an assessment of the entire collection system in the summer of 2007 to identify areas of infiltration and inflow (I&I). Based on the results of the I&I assessment, KPUD will determine which areas of the collection system need to be repaired. This Order requires the Discharger to submit the results of its I&I assessment, and provide a timeframe in which repairs will be made to the collection system. Because the KPUD collection system is located in an environmentally sensitive area, and the water quality in the area are of pristine nature, this Order also requires the Discharger to prepare, submit, and implement a Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan.
24. The sanitary sewer system collects wastewater and consists of sewer pipes, manholes, and/or other conveyance system elements that direct raw sewage to the treatment facility. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the treatment facility. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities. Sanitary sewer overflow is also defined in State Water Resources Control Board Order No. 2006-0003-DWQ, *Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*. A copy of State Water Board Order No. 2006-0003-DWQ is available at http://www.swrcb.ca.gov/resdec/wqorders/2006/wqo/wqo2006_0003.pdf
25. For the facility, any sanitary sewer overflows would consist of varying mixtures of domestic and commercial wastewater, depending on land uses in the sewage collection system. The chief causes of sanitary sewer overflows include grease blockages, root blockages, debris blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm or groundwater inflow/infiltration, lack of capacity, and/or contractor caused blockages.
26. Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause temporary exceedences of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.
27. The Discharger is expected to take all necessary steps to adequately maintain, operate, and prevent discharges from its sanitary sewer collection system. This Order requires the Discharger to prepare and implement a *Sewer System Management Plan* (SSMP) consistent with State Water Board Order No. 2006-0003-DWQ.

Site-Specific Conditions

28. Average annual rainfall for the Kirkwood Meadows area is approximately 46.54 inches per year; the 100-year return annual total rainfall is 84.31 inches per year. This data is based on rainfall data collected from the weather station at Twin Lakes, Alpine County (Station No. A70 9105 00).
29. The wastewater disposal areas are outside of the 100-year floodplain.
30. Soils within effluent disposal areas consist of a mixture of silty sands, with various amounts of intermixed cobbles and gravel.
31. Natural ground slopes within the effluent disposal area are approximately 0.05 feet per foot.
32. The facility lies within the San Joaquin Delta Hydrologic Unit Area No. 514.36, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.

Groundwater Considerations

33. In 1999, Kleinfelder performed a hydrogeologic investigation of the area where the existing leachfields are located. According to the information presented in the hydrogeologic investigation report, groundwater in the vicinity of the leachfields range from depths of 10 to 30 feet below ground surface. Groundwater flows northeast, with an estimated gradient of 0.1 feet per foot.
34. On 12 June 2006, and 17 November 2006, KPUD sampled groundwater monitoring wells MW 2B and MW 5B in the vicinity of new proposed leachfields (leachfields 7, 8, and 9) to provide groundwater quality data for typical domestic wastewater constituents. The groundwater monitoring wells sampled are part of a petroleum groundwater cleanup project at the Kirkwood Maintenance Station. Leachfields 7, 8, and 9 are located near the maintenance station. Results of two sampling events are presented below:

<u>Constituent/Parameter</u>	<u>Units</u>	June 2006	November 2006 Results	
		Results	<u>MW-2B</u>	<u>MW-5B</u>
Depth to groundwater	Measurement	21.7	33.7	33.9
TDS	mg/L	134	97	122
Manganese	mg/L	0.079	3.3	1.0
Sodium	mg/L	6.9	12	8.7
Chloride	mg/L	10	6.8	11
Nitrate as N	mg/L	1.2	<0.05	0.14
TKN	mg/L	<1.0	<1.0	<1.0
pH	Standard units	5.9	6.2	6.0

Results of groundwater samples indicate that the groundwater in the vicinity of the leachfields is of very good quality.

35. In 2004, Kleinfelder performed groundwater modeling to determine what the groundwater levels would be at the effluent disposal areas during both critical (i.e., seasonal high groundwater and high I&I) and design flow conditions (190,000 gpd). Results indicate that groundwater levels from effluent disposal would rise anywhere between 9 and 12 feet beneath the disposal areas under maximum hydraulic loading conditions, but remain between two and seven feet below the disposal trenches. The modeling indicates that the effluent disposal system can function adequately under the design flow conditions.
36. There are no groundwater monitoring wells located upgradient or downgradient of the existing effluent disposal areas. Wells are necessary to determine what background groundwater quality is, and whether the existing effluent disposal activities have impacted the underlying groundwater. On 2 March 2007, staff requested that the Discharger install groundwater monitoring wells around the new and existing leachfields. The Discharger indicated that the groundwater monitoring wells will be installed by the early fall on 2007. This Order requires the Discharger to submit a well installation report certifying that the required monitoring wells have been installed.

Antidegradation Analysis

37. State Water Board Resolution No. 68-16 (hereafter Resolution 68-16 or the "Antidegradation Policy") requires the Regional Water Board in regulating the discharge of waste to maintain high quality waters of the state (i.e., background water quality) until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires that any discharge that could degrade the waters of the state be regulated to assure use of best practicable treatment and control (BPTC) of the discharge to assure that pollution or nuisance will not occur, and the highest water quality consistent with maximum benefit to the people of the State will be maintained.
38. The RWD provided a preliminary antidegradation analysis. The analysis concluded that a thorough antidegradation analysis could not be performed since there was no groundwater quality data available for the wastewater disposal areas. The preliminary antidegradation analysis was based on the wastewater treatment and disposal process, effluent quality data from the WWTP, and limited (one round of groundwater sampling) groundwater quality data collected from the monitoring wells located at the Kirkwood Maintenance Facility. Based on this data, effluent disposal has the potential to degrade the underlying groundwater with respect to salinity, and potentially cause pollution of the underlying groundwater with respect to nitrogen compounds. This Order requires the Discharger to perform a thorough antidegradation analysis once new groundwater wells have been installed and sampled for a minimum of eight quarters.

39. Concentrations of TDS in the potable water supplied to the KPUD are approximately 160 mg/L. The monthly average TDS effluent concentration between the years 2001 through 2005 is approximately 413 mg/L. The average increase of 253 mg/L TDS between supply water and effluent is low for a community with water conservation measures and reflects the absence of water softeners, and the diluting effects of seasonal snowmelt I&I. The incremental addition of dissolved salts through water usage (about 250 mg/L) is within the normal range for domestic use, and is reasonable considering water conservation practices. A TDS effluent limitation of 425 mg/L represents no cost or change in practice for the Discharger, and limits salt degradation to a reasonable amount while providing adequate protection of the groundwater beneath the wastewater disposal system.
40. The average TDS concentrations in the effluent are below 450 mg/L. This value is the relevant numerical water quality limit used through Basin Plan procedures to apply the narrative water quality objective for the protection of agricultural supply, the beneficial use most sensitive to TDS. The individual salt components can safely be assumed to be proportionately low such that TDS can be an effective indicator parameter in their regulation.
41. The WWTP has nitrification/denitrification activated sludge process, which is considered BPTC for nitrogen compounds. Such a process can typically produce an effluent with total nitrogen concentrations of less than 10 mg/L. However, KPUD states that its wastewater is not typical because of cold temperatures, variable flows related to resort activities, and variable strengths of waste due to I&I and water conservation practices. Average monthly total nitrogen concentrations in effluent range from 4.5 to 45 mg/L for the years 2001 through 2005. Background groundwater concentrations appear to be approximately 1.0 mg/L for total nitrogen (see Finding # 35). Based on these effluent concentrations and the apparent background groundwater quality, the current wastewater treatment process for nitrogen compounds does not appear adequate to protect the underlying groundwater from pollution by nitrogen compounds. This Order requires the Discharger to submit a *BPTC Evaluation Workplan* to evaluate the facility's waste treatment and disposal system to determine additional best practicable treatment and control for nitrogen compounds.
42. The Regional Water Board finds that some degradation of the groundwater beneath the WWTP is consistent with the maximum benefit to the people of the state provided that:
 - a. The degradation is confined within a specified boundary;
 - b. The Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating BPTC measures;
 - c. The degradation is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order; and
 - d. The degradation does not result in water quality less than that prescribed in the Basin Plan.
43. Some degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of California. The technology,

energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Degradation of groundwater by constituents (e.g., toxic chemicals) other than those specified in the groundwater limitations in this Order, and by constituents that can be effectively removed by conventional treatment (e.g., total coliform bacteria) is prohibited. When allowed, the degree of degradation permitted depends upon many factors, such as, background water quality, the waste constituent, the beneficial uses and most stringent water quality objective, source control measures, waste constituent treatability.

Treatment and Control Practices

44. Resolution No. 68-16 requires the discharge to be regulated to assure use of best practicable treatment and control (BPTC). The Discharger will provide treatment and control of the discharge that incorporates:
 - a. Use of a low salinity, low hardness water supply;
 - b. Use of Aluminum in the wastewater treatment process to reduce effluent phosphorous concentrations;
 - c. Use of nitrification/denitrification treatment process to minimize organic and nitrogen content in effluent;
 - d. Alarm and automatic flow diversion systems to prevent system bypass or overflow;
 - e. Use of membrane treatment technology is used to minimize particulate emissions to the effluent disposal system;
 - f. Wastewater treated to tertiary treatment level;
 - g. Disposal of effluent via subsurface leachfields, to allow additional treatment and minimize evapoconcentration of salts.
 - h. Appropriate biosolids storage and disposal practices;
 - i. An Operation and Maintenance (O&M) manual; and
 - j. Certified operators to assure proper operation and maintenance.
45. The WWTP design incorporates numerous BPTC measures. However, in order to determine compliance with Resolution No. 68-16, it is appropriate to require that the Discharger establish a schedule for installation and sampling of groundwater monitoring wells, formally determine background groundwater concentrations for selected constituents, and determine additional BPTC measures to reduce nitrogen in effluent. If groundwater is degraded or there is evidence that the discharge may cause degradation, then the Discharger will be required to evaluate and implement additional BPTC measures for each conveyance, treatment, storage, and disposal component of the system. Completion of these tasks will ensure that BPTC and the highest water quality consistent with the maximum benefit to the people of the state will be achieved.
46. This Order establishes interim groundwater limitations for the WWTP that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater

quality that exceeds water quality objectives set forth in the Basin Plan. This Order also contains tasks for assuring that BPTC and the highest water quality consistent with the maximum benefit to the people of the state will be achieved. Accordingly, the discharge is consistent with Resolution 68-16 and the Basin Plan. Based on the results of the scheduled tasks, the Regional Water Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution 68-16.

Basin Plan, Beneficial Uses, and Regulatory Considerations

47. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Board. These requirements implement the Basin Plan.
48. Surface water drainage in the vicinity of the effluent disposal area flows to Kirkwood Creek, which is a tributary to Caples Creek. Caples Creek flows into the Silver Fork of the American River, which flows into the South Fork of the American River. The beneficial uses of the South Fork of the American River are municipal and domestic supply; hydropower generation; industrial process supply; industrial service supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning, reproduction, and/or early development; and wildlife habitat.
49. The Basin Plan designates the beneficial uses of underlying groundwater as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
50. The Basin Plan establishes numerical and narrative water quality objectives for surface water and groundwater within the basin. Numerical and narrative water quality objectives are maximum (i.e., least stringent) limits directly applicable to the protection of designated beneficial uses of the water. Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, are subject to the authority of the State or Regional Board, and that may be reasonably controlled. Controllable factors are not allowed to cause further degradation of water quality in instances where uncontrollable factors have already resulted in water quality objectives being exceeded. In addition, the water quality objectives do not require improvement over naturally occurring background concentrations. The Basin Plan requires that the Regional Water Board, on a case-by-case basis, follow specified procedures to determine maximum numerical limitations that apply the narrative objectives when it adopts waste discharge requirements.
51. The Basin Plan includes a water quality objective for Chemical Constituents that, at a minimum, requires waters designated as domestic or municipal supply to meet the maximum contaminant levels (MCLs) specified in the following provisions of Title 22, California Code of Regulations (CCR): Tables 64431-A (Inorganic Chemicals) and 64431-

B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) of Section 64449, and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. The Basin Plan's incorporation of these provisions by reference is prospective, and includes future changes to the incorporated provisions as the changes take effect. The Basin Plan recognizes that the Regional Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

52. The Basin Plan contains narrative water quality objectives for Chemical Constituents, Tastes and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. The Chemical Constituents objective requires that groundwater "shall not contain chemical constituents in concentrations that adversely affect beneficial uses." The Tastes and Odors objective requires that groundwater "shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses." Chapter IV, Implementation, of the Basin Plan contains the "Policy for Application of Water Quality Objectives." This Policy specifies, in part, that compliance with narrative water quality objectives may be evaluated considering numerical criteria and guidelines developed and/or published by other agencies and organizations.
53. The "Antidegradation" section of the attached Information Sheet lists the various waste constituents identified thus far as fitting the restriction of the Findings, along with limits of each constituent necessary to maintain beneficial uses known to be adversely affected at certain concentrations of the waste constituent in groundwater. The listing identifies the constituent, the beneficial use, and its associated limit, as well as the technical reference for the limit. Some limits become less restrictive when the water supply is limited to certain applications of a beneficial use, but that requires additional factual information. Interim groundwater limitations for each constituent reflect the most restrictive listed limit for the waste constituent, except if natural background quality is greater, in which case background becomes the interim limitation.

Other Regulatory Considerations

54. On 2 May 2006, the State Water Resources Control Board adopted *Statewide General Waste Discharge Requirements For Sanitary Sewer Systems General Order No. 2006-0003-DWQ* (General Order). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with the Order. The Discharger's collection system exceeds one mile in length, and therefore the General Order is applicable. In July 2006, the Discharger submitted a Notice of Intent to the State Water Board for coverage under General Order 2006-0003-DWQ.
55. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in 40 CFR 503, *Standard for the Use or Disposal of Sewage Sludge*, which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria.

56. The Regional Water Board is using the Standards in 40 CFR 503 as guidelines in establishing this Order, but the Regional Water Board is not the implementing agency for 40 CFR 503 regulations. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to the EPA. The RWD states that all biosolids will be hauled to a separate permitted facility.
57. The State Board adopted Order No. 97-03 DWQ (General Permit No. CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. Industrial Storm Water permitting requirements do not apply to this facility since the WWTP treats and disposes of less than 1.0 million gallons per day. Therefore, the Discharger is not required to apply for a stormwater NPDES permit.
58. An Environmental Impact Report (EIR) was prepared for the Kirkwood Specific Plan, the Mountain Master Plan, and the Wastewater Treatment Plant Upgrade project. On 8 May 2003, KPUD adopted the Final EIR for the project in accordance with the California Environmental Quality Act (CCR, Title 14, Section 15261 et. seq.).
59. Section 13267(b) of the CWC provides that: "In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."

The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. R5-2007-_____ are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

60. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to CWC Section 13801, apply to all monitoring wells used to monitor the impacts of wastewater disposal governed by this Order.
61. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27 CCR Section 20380. While the WWTP is exempt from Title 27, the data analysis methods

of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.

62. The discharge authorized herein and the treatment and storage facilities associated with the discharge, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, CCR, Section 20380 et seq. The exemption, pursuant to Title 27 CCR Section 20090(a), is based on the following
- a. The waste consists primarily of domestic sewage and treated effluent;
 - b. The waste discharge requirements are consistent with water quality objectives; and
 - c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.
63. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

64. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, as well as the Regional Water Board's administrative record, were considered in establishing the following conditions of discharge.
65. The Discharger and interested agencies and persons have been notified of the Regional Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.
66. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that Order No. 94-108 is rescinded, and that pursuant to Sections 13263 and 13267 of the California Water Code, Kirkwood Public Utility District, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder, shall comply with the following:

[Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.]

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Bypass or overflow of untreated or partially treated waste is prohibited.

3. Discharge of sewage from the sanitary sewer system at any point upstream of the wastewater treatment plant is prohibited. Discharge of treated wastewater outside of the effluent disposal area (i.e., leachfields) is prohibited.
4. Discharge of waste classified as "hazardous" under Title 23 CCR Chapter 15, Section 2521, or "designated," as defined in Section 13173 of CWC is prohibited.
5. Surfacing of waste within or downgradient of the effluent disposal area is prohibited.

B. Discharge Specifications

1. The monthly average influent flow shall not exceed 190,000 gpd, or a peak daily flow of 274,000 gallons.
2. Wastewater within the wastewater disposal trenches shall be maintained within one foot or more below ground surface.
3. Wastewater treatment and disposal shall not cause pollution or a nuisance as defined by Section 13050 of the CWC.
4. Public contact with wastewater in the effluent disposal areas shall be precluded or controlled through such means as fences, signs, or acceptable alternatives.
5. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.
6. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal systems.
7. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge. The wastewater shall be filtered at all times.
8. The freeboard in the emergency storage basin shall never be less than one foot as measured vertically from the water surface to the lowest point of overflow.
9. All treatment and disposal facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
10. The wastewater treatment and disposal system shall have sufficient treatment and disposal capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration. Design seasonal precipitation shall

be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical precipitation patterns.

11. Disposal of wastewater shall be confined to each wastewater disposal area as defined in Finding No.14 of this Order.
12. A 100-foot buffer zone shall be maintained between the nearest point of the wastewater disposal system and any year-round flowing creek, spring, domestic well, or irrigation well.
13. A 50-foot buffer zone shall be maintained between the nearest point of the wastewater disposal system and any seasonal drainage course.

C. Effluent Limitations

1. Effluent discharged from the wastewater treatment plant into the wastewater disposal system shall not exceed the following limits:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD ₅ ¹	mg/L	10	20
Total N as N	mg/L	10 ² , 20 ³	--
TDS	mg/L	425	--
Total Phosphorous	mg/L	5	
Total Coliform Organisms	MPN/100ml	<2.0	23

¹ BOD₅ denotes 5-day Biochemical Oxygen Demand.

² Total Nitrogen effluent limits for the months of May through October, or lower as needed to prevent pollution

³ Total Nitrogen effluent limits for the months of November through April, or lower as needed to prevent pollution.

2. Wastewater discharged to the wastewater disposal areas shall not have a pH less than 6.5 or greater than 8.4.

D. General Solids Disposal Specifications

Sludge means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screenings generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the facility. Biosolids refers to sludge that has undergone sufficient treatment and testing to qualify for reuse pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land recycling.

1. Sludge and solid waste shall be removed from screens, sumps, basins, and clarifiers as needed to ensure optimal plant operation.
2. Any storage or treatment of residual sludge, solid waste, and biosolids at the facility shall be temporary and confined to the treatment facility property. The waste shall be controlled and contained in a manner that minimizes leachate formation and precludes

infiltration of waste constituents into soils in a mass or at concentrations that will violate the Groundwater Limitations of this Order.

3. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27 CCR Division 2. Removal for further treatment, disposal, or reuse at disposal sites operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy this specification.
4. Use and disposal of biosolids shall comply with the self-implementing Federal regulations of 40 CFR 503, which are subject to enforcement by the U.S. EPA, not the Regional Water Board. If during the life of this Order, the state accepts primacy for implementation of 40 CFR 503, the Regional Water Board may also initiate enforcement where appropriate.

E. Groundwater Limitations

1. Release of waste constituents from the WWTP, including the wastewater disposal area shall not cause groundwater to:
 - a. Contain any of the following constituents in concentrations greater than listed or greater than natural background quality, whichever is greater. Note that natural background conditions have not yet been established for the wastewater disposal areas.

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
Boron	mg/L	0.7
Chloride	mg/L	106
Iron	mg/L	0.3
Manganese	mg/L	0.05
Sodium	mg/L	69
Total Coliform Organisms	MPN/100 mL	<2.2
Total Dissolved Solids	mg/L	450
Total Nitrogen	mg/L	10
Nitrite (as N)	mg/L	1
Nitrate (as N)	mg/L	10
Ammonia (as NH ₄)	mg/L	1.5
Bromoform	µg/L	4
Bromodichloromethane	µg/L	0.27
Chloroform	µg/L	1.1
Dibromochloromethane	µg/L	0.37

- b. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.
 - c. Impart taste, odor, toxicity, or color that creates nuisance or impairs any beneficial use.

F. Provisions

1. All of the following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision F.3.
 - a. By **31 October 2007**, the Discharger shall submit and immediately implement an Inflow and Infiltration (I/I) Assessment Report that describes the results of the Discharger's I/I evaluation of the collection system, and describes the repairs that must be completed to reduce I/I to industry standards. The report shall also include a proposed schedule for necessary repairs and/or replacement of collection system components contributing to the I/I problems.
 - b. By **15 November 2007**, the Discharger shall submit and implement a report certifying that it has either fixed the existing influent flow meter, or installed a new flow meter, and that the meter was calibrated to accurately monitor influent flows into the treatment plant.
 - c. By **30 November 2007**, the Discharger shall submit a Monitoring Well Installation Report prepared in accordance with, and including the items listed in, the second section of Attachment D: *"Monitoring Well Workplan and Monitoring Well Installation Report Guidance."* The report shall describe the installation and development of the new monitoring wells and explain any deviation from the approved workplan.
 - d. By **15 January 2008**, the Discharger shall submit a *Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan* (SSSOP) for the entire KPUD WWTP collection system. The SSSOP shall describe the actions designed to prevent, or minimize the potential for sanitary sewer overflows, and include the information required in Sections 4 and 6 of State Water Resources Control Board Order No. 2006-0003-DWQ . The Discharger shall maintain the SSSOP in an up-to-date condition and shall amend the SSSOP whenever there is a change (e.g. in the design, construction, operation, or maintenance of the sanitary sewer system or sewer facilities) that materially affects the potential for sanitary sewer overflows, or whenever there is a sanitary sewer overflow. The Discharger shall ensure that the up-to-date SSSOP is readily available to sewer system personnel at all times and that sewer system personnel are familiar with it.
 - e. By **31 December 2008**, the Discharger shall submit a *Nitrogen BPTC Evaluation Report and Implementation Workplan*. The report shall include a comprehensive evaluation of the BPTC measures studied to reduce nitrogen compounds in effluent, a discussion of BPTC measures proposed for implementation (i.e., recommendations for WWTP modifications), estimated concentration or mass loading reductions for each BPTC measure, specific methods the Discharger proposes to monitor and assure continuous optimal performance of BPTC measures, and proposed schedule for modifications. The schedule for full implementation shall be as short as practicable, and in no case shall it exceed two years past the Executive Officer's approval of the workplan unless specifically approved by the Regional Water Board. The

component evaluation, recommended improvements, and implementation schedule are subject to the Executive Officer's approval.

- f. By **31 December 2009**, the Discharger shall submit a *Background Groundwater Quality Study Report*. For each groundwater monitoring parameter/constituent identified in the MRP, the report shall present a summary of monitoring data and calculation of the concentration in background monitoring wells. Determination of background quality shall be made using the methods described in Title 27 CCR, Section 20415(e)(10), and shall be based on data from at least eight consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare the calculated background concentration with the interim numeric limitations set forth in Groundwater Limitation E.1.a. Where background concentrations are statistically greater than the interim limitations specified in Groundwater Limitation E.1.a, the report shall recommend final groundwater limitations which comply with Resolution 68-16 for the waste constituents listed therein. Subsequent use of a concentration as a final groundwater limitation will be subject to the approval of the Executive Officer.
2. If groundwater monitoring results show that the discharge of waste is causing groundwater to contain waste constituents in concentrations statistically greater than background water quality then, within **120 days** of the request of the Executive Officer, the Discharger shall submit a *BPTC Evaluation Workplan* that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of each component of the facility's waste treatment and disposal system to determine best practicable treatment and control for each waste constituent listed in the Groundwater Limitation E.1.a of this Order. The workplan shall contain a preliminary evaluation of each component of the WWTP and effluent disposal system and propose a time schedule for completing the comprehensive technical evaluation. The schedule to complete the evaluation shall be as short as practicable, and shall not exceed one year.
3. In accordance with California Business and Professions Code Sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.
4. The Discharger shall comply with Monitoring and Reporting Program No. R5-200_ - _____, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

5. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
6. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with discharge limits specified in this order.
7. The Discharger shall provide certified wastewater treatment plant operators in accordance with Title 23CCR, Division 3, Chapter 26.
8. As described in the Standard Provisions, the Discharger shall report promptly to the Regional Water Board any material change or proposed change in the character, location, or volume of the discharge.
9. Upon the reduction, loss, or failure of the sanitary sewer system resulting in a sanitary sewer overflow, the Discharger shall take any necessary remedial action to (a) control or limit the volume of sewage discharged, (b) terminate the sewage discharge as rapidly as possible, and (c) recover as much as possible of the sewage discharged (including wash down water) for proper disposal. The Discharger shall implement all applicable remedial actions including, but not limited to, the following:
 - a. Interception and rerouting of sewage flows around the sewage line failure;
 - b. Vacuum truck recovery of sanitary sewer overflows and wash down water;
 - c. Use of portable aerators where complete recovery of the sanitary sewer overflows are not practicable and where severe oxygen depletion is expected in surface waters; and
 - d. Cleanup of sewage-related debris at the overflow site.
10. The Discharger shall report to the Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."
11. The Discharger shall not allow pollutant-free wastewater to be discharged into the wastewater collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.
12. The Discharger shall submit to the Regional Water Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharge shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in

compliance. The Discharger shall notify the Regional Water Board in writing when it returns to compliance with the time schedule.

13. In the event of any change in control or ownership of the facility or wastewater disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.
14. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or recession of this Order.
15. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
16. The Regional Water Board will review this Order periodically and will revise requirements when necessary.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on _____.

PAMELA C. CREEDON, Executive Officer

JSK: 07/02/07